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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,162	03/31/2008	Jorg Behrens	DE03 0414 US1	3846

65913 7590 12/29/2009

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EXAMINER	
IM, JUNGHWA M	

ART UNIT	PAPER NUMBER
2811	

NOTIFICATION DATE	DELIVERY MODE
12/29/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/581,162	BEHRENS, JORG	
	Examiner	Art Unit	
	JUNGHWA M. IM	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/5/2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al. (US 6680545), hereinafter Young in view of Saran et al. (US 6143396), hereafter Saran and Angell et al. (US 6864578).

Regarding claims 1 and 9, Fig. 1 of Young shows a semiconductor component comprising;

a semiconductor chip made of a doped silicon substrate (BJT), which chip is doped into a semiconductor device and structured, and comprises an inner connection metallization (11, 12; bonding pad) in a contact window, and said inner connection

metallization of said semiconductor chip is connected to the respective outer connection metallization by a wire bond connection (21, 22),

Fig. 1 of Young shows most aspects of the instant invention except said inner connection metallization of said semiconductor chip comprises a reinforcing system having an open grid structure on the doped silicon substrate with an opening, that is, a bonding pad on the semiconductor substrate comprising an grid/lattice formation with an opening. Fig. 1 of Saran shows a bonding pad (12) comprises an inner connection metallization in a contact window characterized in that the inner connection metallization comprises a reinforcing system having an open grid structure (30) on the doped silicon substrate (col. 1, lines 10-13). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Saran into the device of Young in order to have the inner connection metallization of the semiconductor chip comprising a reinforcing system with an open grid structure to strengthen the bonding structure.

The combination of Young/Saran shows most aspects of the instant invention except the reinforcing system formed of a different material than the inner connection. Fig. 3 of Angell shows a reinforcing system (24) formed of a different material the inner connection (26). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Angell into the device of Young/ Saran in order to have the reinforcing system formed of a different material than the inner connection to alleviate the stress.

Regarding claim 14, Fig. 1 of Young shows discrete semiconductor device comprising:

a silicon substrate having an emitter and a base (col. 4, line 64 - col. 5, line 9);

the emitter having an emitter contact formed thereon, the emitter contact comprising an inner connection metallization (11; pad for emitter) and;

the base having a base contact formed thereon, the base contact comprising an inner connection metallization (11; pad for base);

a leadframe (150) having connection pins (101, 103); and

a bond wire (21, 25) connected between the emitter contact and a connection pin of the leadframe; and

a bond wire (22) connected between the base contact and a connection pin of the leadframe.

Fig. 1 of Young shows most aspects of the instant invention except said inner connection metallization of the emitter and the base of said semiconductor chip comprises a reinforcing system having an open grid structure on the doped silicon substrate with an opening, that is, a bonding pad of the emitter and the base on the semiconductor substrate comprising an grid/lattice formation with an opening. Fig. 1 of Saran shows a bonding pad (12) comprises an inner connection metallization in a contact window characterized in that the inner connection metallization comprises a reinforcing system having an open grid structure (30) on the doped silicon substrate (col. 1, lines 10-13). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Saran into the device of

Young in order to have the inner connection metallization of the emitter and the base the semiconductor chip comprising a reinforcing system with an open grid structure to strengthen the bonding structure.

The combination of Young/Saran shows most aspects of the instant invention except the reinforcing system formed of a different material than the inner connection. Fig. 3 of Angell shows a reinforcing system (24) formed of a different material the inner connection (26). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Angell into the device of Young/ Saran in order to have the reinforcing system formed of a different material than the inner connection to alleviate the stress.

Regarding claims 2, 10 and 15, Fig. 1 of Saran shows the reinforcing system having an open grid structure is formed from an insulation coating (col. 3, lines 16-37).

Regarding claims 3, 11 and 16, Fig. 7 of Saran shows a semiconductor component as claimed in claim 1, characterized in that the grid structure is formed so as to be an open groove structure.

Regarding claims 4, 12 and 17, Fig. 4A of Saran shows a semiconductor component as claimed in claim 1, characterized in that the grid structure may be formed so as to be an open tube structure.

Regarding claims 5, 13 and 18, Fig. 4A of Saran shows a semiconductor component as claimed in claim 1, characterized in that the area of the grid structure of thermal oxide (col. 3, lines 32-38) constitutes >50% of the area of the contact window.

Regarding claim 6, the combination of Young/Saran shows the open grid structure comprise grid lands, however, fails to show "wherein a ratio of height, h, to width, b, of the grid lands is in the range of 1:25 to 1:50." However, it would have been obvious to one of ordinary skill in the art at the time of the invention made to have a ratio of height to width of the grid lands in the range of 1:25 to 1:50 to increase the structural reliability, since it would have been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only in routine skill in the art. *In re Aller,* 105 USPQ 233.

Regarding claim 7, the combination of Young/Saran shows "the open grid structure comprises grid lands and grid openings," however, fails to show wherein the ratio between the area of the grid lands and the area of the grid openings is greater than 70%." However, it would have been obvious to one of ordinary skill in the art at the time of the invention made to have the area of the grid openings greater than 70% to adjust the mechanical strength, since it would have been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only in routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 8 and 19, insofar as understood, Saran discloses in that the area of the grid structure of thermal oxide the silicon substrate (col. 3, lines 32-38).

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUNGHWA M. IM whose telephone number is (571)272-1655. The examiner can normally be reached on MON.-FRI. 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Junghwa M. Im/
Examiner, Art Unit 2811

/J. M. I./
Examiner, Art Unit 2811